Babytherm 8000 WB / OC and Radiant Heater 600 W Electrical Safety Test according to UL 2601-1 in the USA and Canada

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1. Babytherm 8000 WB / OC without Radiant Heater

1.1 Visual inspection of Babytherm 8000 WB / OC

- Power cord of the Babytherm
- Height adjustment, compare fuses to stated ratings.

1.2 Safety Testing Mattress Heating with Biotek Model 501

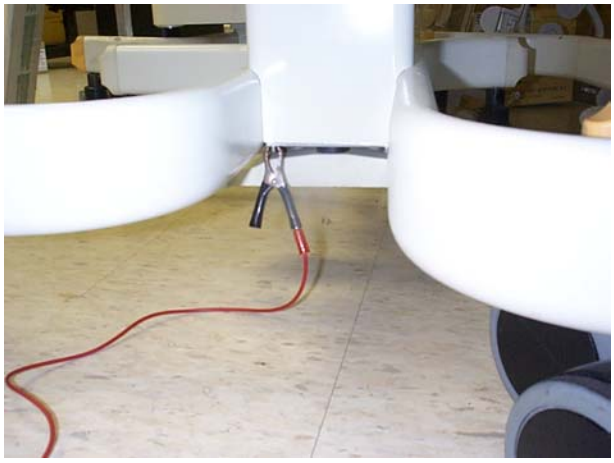
- **Warning**: These tests can expose personnel to hazardous electric shock and must be carried out with caution.
- Note: Do not plug the Biotek 501 Pro safety analyzer power cord into a line isolation monitor as inaccurate readings may occur.
- Plug the Biotek 501 Pro power cord into a live AC receptacle, place the power switch of the Biotek 501 Pro to the "1" or ON position and ensure that the keys marked "GROUND", "NEUTRAL" and "POLARITY" are in the NORMAL position.
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.

1.2.1 Chassis Resistance Testing

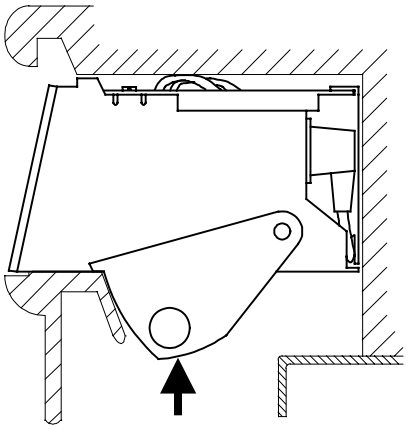
- Attach the ground lead from the red "Test lead" input to the ground hole of the AC test receptacle on the Biotek 501 Pro. Select the "Single lead" condition by ensuring that the "SINGLE/DUAL" key is not illuminated. Press the gray key marked "RESIST", then press the blue key marked "CAL". When the word CAL is no longer shown in the display window of the Biotek 501 Pro, you may proceed.
- Remove the red lead from the ground hole of the AC test receptacle and attach the alligator clip to the free end, leaving the other end plugged into the red "Test lead" input of the Biotek 501 Pro with the "Single Lead" and "Resistance" conditions still selected.

- Plug the Babytherm power cord from the Electronics (not from the Radiant Heater, if available) into the test receptacle of the Biotek 501 Pro.

- Perform 2 tests with the alligator clip attached to the following test items of the Babytherm 8000:



1) Screw at the base plate of electrical height adjustment (if available)



2) Electronics housing of the mattress heating (if available)

- The resistance reading then shown on the Biotek 501 Pro is the "Chassis Resistance". Bend and exercise the power cord to check for intermittent reading.

- Maximum allowable test values:

Chassis Resistance	0.2 Ohm

- Additional test for the Babytherm 8000 with installed mattress heating only: Perform test with the probe attached to aluminum plate of the mattress heating.

  Test value for the aluminum plate of the mattress heating:

Chassis Resistance	infinity

- Afterwards connect alligator clip at test item 2), or if not available at test item 1).

1.2.2 Enclosure Leakage Current (Chassis Leakage Testing)

- Press the gray "LEAKAGE" key, leaving all other selections from the previous test the same.

- Switch on Babytherm 8000 and allow the unit to complete the self test.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.
- This is a measurement of the leakage current from the Chassis to earth ground.
- Activate height adjustment (if available) during every following test.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 µA
Normal Ground, Reverse Polarity, Normal Neutral:	100 µA

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	300 µA, but not 0 µA
Open Ground, Reverse Polarity, Normal Neutral:	300 µA, but not 0 µA

1.2.3 Earth Leakage Current (Ground Wire Leakage Testing)

- Remove the red lead with the alligator clip from the Babytherm 8000.
- Remove the alligator clip from the red test lead and plug this end into the green input jack "GROUND" on the back panel on the Biotek 501 Pro.
- Leave all other selections from the previous test the same.
- The Babytherm is still switched on.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.
- This is a measurement of the leakage current flowing through the ground wire of the power cord.

- Activate height adjustment (if available) during the following tests.
- Maximum allowable test values under Normal Condition:

Open Ground, Normal Polarity, Normal Neutral:	300 µA, but not 0 µA
Open Ground, Reverse Polarity, Normal Neutral:	300 µA, but not 0 µA

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Open Neutral:	300 µA
Open Ground, Reverse Polarity, Open Neutral:	300 µA

- Switch off Babytherm.
- Remove the Babytherm power cord from the Biotek 501 Pro.

2. Radiant Heater 600 W

2.1 Visual inspection of the RH 600

- Power cord of the RH 600
- Compare fuses to stated ratings on the backside of the RH 600 next to the inlet of the power cord.

2.2 Safety Testing RH 600 with Biotek Model 501

- **Warning**: These tests can expose personnel to hazardous electric shock and must be carried out with caution.
- Note: Do not plug the Biotek 501 Pro safety analyzer power cord into a line isolation monitor as inaccurate readings may occur.
- Plug the Biotek 501 Pro power cord into a live AC receptacle, place the power switch of the Biotek 501 Pro to the "1" or ON position and ensure that the keys marked "GROUND", "NEUTRAL" and "POLARITY" are in the NORMAL position.
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.

2.2.1 Chassis Resistance Testing

- Attach the ground lead from the red "Test lead" input to the ground hole of the AC test receptacle on the Biotek 501 Pro. Select the "Single lead" condition by ensuring that the "SINGLE/DUAL" key is not illuminated. Press the gray key marked "RESIST", then press the blue key marked "CAL". When the word CAL is no longer shown in the display window of the Biotek 501 Pro, you may proceed.
- Remove the red lead from the ground hole of the AC test receptacle and attach the alligator clip to the free end, leaving the other end plugged into the red "Test lead" input of the Biotek 501 Pro with the "Single Lead" and "Resistance" conditions still selected.

- Plug the RH 600 power cord (not from the Babytherm, if available) into the test receptacle of the Biotek 501 Pro.

- Perform 9 tests with the probe attached to the following test items of the RH 600 (Note: Maximum allowable test value for all 9 test items is 0.2 Ohm):

  1) Electrolyte-polished mesh guard (P/N 2M18670)

  2) Electrolyte-polished holder (P/N 2M20571) of the halogen lamp

3) Electrolyte-polished reflector plate (P/N 2M19291)

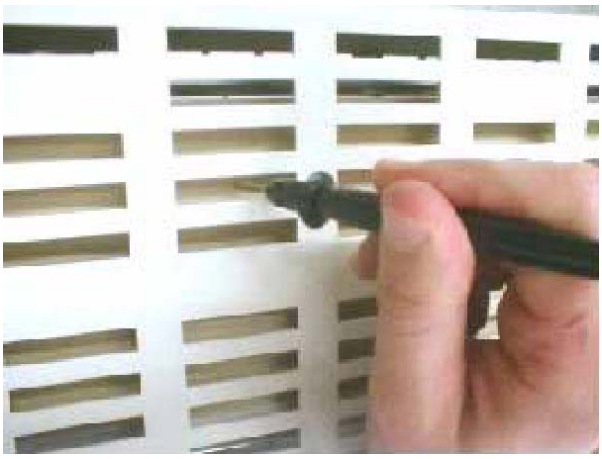
4) Left-hand and right-hand shielding plates (P/N 2M18648)

Note: The plate is anodized. The surface at the measurement point must be therefore be scratched a little.

5) Left-hand side plates (P/N 2M19293) and right-hand side plates (P/N 2M19292)

Note: The plate is anodized. The surface at the measurement point must be therefore be scratched a little.

6) Chromated cover plate (P/N 2M20265) of the radiant heater

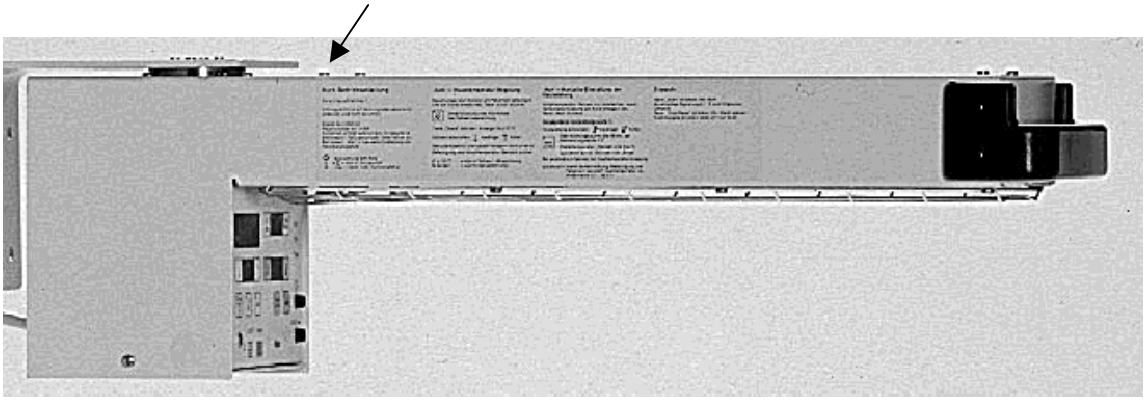


7) Housing rear wall of radiant heater

Remove the screw in the center of the cover, and scratch the varnished surface in the area underneath the screw.

8) Varnish-free point of chromated radiant heater housing (P/N 2M19296)

9) Connect alligator clip to screw on top of the heater



- The resistance reading then shown on the Biotek 501 Pro is the "Chassis Resistance". Bend and exercise the power cord to check for intermittent reading.
- Maximum allowable test value for all 10 test items:

Chassis Resistance	0.2 Ohm

- Afterwards leave alligator clip at test item 9).

2.2.2 Enclosure Leakage Current (Chassis Leakage Testing)

- Press the gray "LEAKAGE" key, leaving all other selections from the previous test the same.
- Switch on RH 600 and allow the unit to complete the self test.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.
- This is a measurement of the leakage current from the Chassis to earth ground.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 µA
Normal Ground, Reverse Polarity, Normal Neutral:	100 µA

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	300 µA, but not 0 µA
Open Ground, Reverse Polarity, Normal Neutral:	300 µA, but not 0 µA

2.2.3 Earth Leakage Current (Ground Wire Leakage Testing)

- Remove the red lead with the alligator clip from the RH 600.
- Remove the alligator clip from the red test lead and plug this end into the green input jack "GROUND" on the back panel on the Biotek 501 Pro.
- Leave all other selections from the previous test the same.
- The RH 600 is still switched on.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.
- This is a measurement of the leakage current flowing through the ground wire of the power cord.
- Maximum allowable test values under Normal Condition:

Open Ground, Normal Polarity, Normal Neutral:	300 µA, but not 0 µA
Open Ground, Reverse Polarity, Normal Neutral:	300 µA, but not 0 µA

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Open Neutral:	300 µA
Open Ground, Reverse Polarity, Open Neutral:	300 µA

- Switch off RH 600.
- Maximum allowable test values under Normal Condition, unit switched off:

Open Ground, Normal Polarity, Normal Neutral:	300 µA, but not 0 µA
Open Ground, Reverse Polarity, Normal Neutral:	300 µA, but not 0 µA

Rationale: On/Off switch is a standby switch on most of the units (USA and Canada only, see label of On/Off switch). The earth leakage current in normal condition may be higher with standby switch in off position.

2.2.4 Patient leakage current from the sensor connection to earth

- Remove the test lead from the Biotek 501 Pro and leave all other selections from the previous test the same.

- Short all pins of the skin temperature connector by using the
  a) Skin Temperature Sensor Simulator 79 01 236 with the switch in "REXT" position. Short the two yellow "REXT" outlets from the simulator and connect "REXT" to the input jack "RA" of the Biotek 501 Pro.

     or

  b) Use Adapter 2M 20 736 and short a sensor connector as a test lead to the safety tester. Plug the other end into the input jack "RA" of the Biotek 501 Pro.

- Select the "ECG LEAK" key on the Biotek 501 Pro.

- Use the Increment or Decrement arrow on the Biotek 501 Pro to select the "RA-Gnd" option.

- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".

- Switch on RH 600.

- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 µA
Normal Ground, Reverse Polarity, Normal Neutral:	100 µA

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 µA
Open Ground, Reverse Polarity, Normal Neutral:	500 µA

- Switch off RH 600 and remove the test equipment.